

ECE571: Advanced Microprocessor Design – Homework 7
Spring 2018

Due: Thursday 29 March 2018, 3:30pm

Create a document that contains the answers to the questions below. A .pdf or .txt file is preferred but I can accept MS Office or Libreoffice format if necessary.

1. Read the website article:

The AMD Zen and Ryzen 7 Review: A Deep Dive on 1800X, 1700X and 1700 by Ian Cutress (note that there are ‘8 pages to this article).

<https://www.anandtech.com/show/11170/the-amd-zen-and-ryzen-7-review-a-deep-dive-on-1800x-1700x-and-1700>

2. Answer the following questions:

- (a) List two new features of the Zen architecture.
- (b) How is AMD “Pure Power” different from typical CPU frequency scaling?
- (c) What kind of branch prefetcher does the Zen have?
- (d) What type of DRAM works with the Zen?

3. Also find and read the article:

Zen: An Energy Efficient High-Performance x86 Core by Singh et al. from the 2018 IEEE Journal of Solid-State Circuits (vol53 no. 1).

This is available through IEEE explore. You can download it for free via the UMaine Library, go to their IEEE page:

<https://library.umaine.edu/indexesdb/dbdetails.asp?field=Name&search=IEEE+Xplore>

and login with your UMaine account, then search by title to find it. If you have trouble getting a copy let me know and I can provide one.

4. The article is pretty dense, don’t feel like you need to understand it all. Answer the following questions.

- (a) What techniques helped leader to a 52% in instruction per clock?
- (b) How big is the Zen compared to the Skylake core (see Figure 22).
- (c) Is Zen vs Skylake a fair comparison? When was Skylake released?

5. **Submitting your work.**

- Create the document containing the answers to the questions asked.
- Please make sure your name appears in the document.
- e-mail the file to me by the homework deadline.